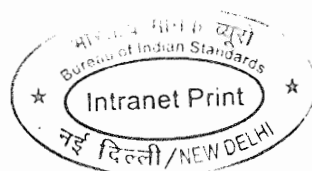


IS : 5793 - 1970
Reaffirmed - 2012

Indian Standard
SPECIFICATION FOR
ANEROID BAROMETERS

UDC 551.508.4



© Copyright 1971

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

March 1971

MAX. RETAIL PRICE
₹ 130.00
ALL TAXES

**AMENDMENT NO.1 AUGUST 2002
TO
IS 5793 : 1970 SPECIFICATION FOR ANEROID
BAROMETERS**

Substitute 'hecta Pascal (hPa)' *for* 'millibar (mb)' wherever appears.

(*Page 2, clause 1.1, line 2*) — Substitute 'land' *for* 'laid'.

(BP 21)

Reprography Unit, BIS, New Delhi, India

Indian Standard
SPECIFICATION FOR
ANEROID BAROMETERS

Meteorological Instruments Sectional Committee, EDC 69

Chairman

MISS A. MANI

Representing

India Meteorological Department, New Delhi

Members

SHRI N. R. CHAKRABORTY

The National Instruments Ltd, Calcutta

SHRI N. R. DAS GUPTA (*Alternate*)

DEPUTY DIRECTOR (METEOROLOGY) Indian Navy

STAFF OFFICER (METEOROLOGY)

(*Alternate*)

JOINT DIRECTOR, RESEARCH (B & F) Research, Designs & Standards Organization
(Ministry of Railways), Lucknow

DEPUTY DIRECTOR, RESEARCH

(B & F) (*Alternate*)

DR R. N. MATHUR

Central Scientific Instruments Organization (CSIR),
Chandigarh

SHRI D. D. PURI (*Alternate*)

DR R. H. MENDONSA

Lawrence & Mayo (India) Private Limited,
Calcutta

SHRI S. VARADARAJAN (*Alternate*)

SHRI PREM PRAKASH

National Physical Laboratory (CSIR), New Delhi

SHRI OM PRAKASH (*Alternate*)

SHRI K. K. ROHATGI

Government Precision Instruments Factory, Calcutta

Gp CAPT S. DAS SARMA

Indian Air Force

WG CDR P. SRINIVASAN (*Alternate*)

SHRI M. V. PATANKAR,

Director General, ISI (*Ex-officio Member*)

Director (Mech Engg)

Secretary

SHRI S. M. RAZVI

Deputy Director (Mech Engg), ISI

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

IS : 5793 - 1970

Indian Standard
SPECIFICATION FOR
ANEROID BAROMETERS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 4 September 1970, after the draft finalized by the Meteorological Instruments Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 Atmospheric pressure is generally measured by means of a mercury or aneroid barometer. The requirements of mercury barometer are covered in IS : 5798-1970*.

0.3 With the increasing requirements in the country for these instruments, the formulation of an Indian Standard for aneroid barometers and their test and certification by ISI has become necessary. This standard has been prepared in the interests of standardization of aneroid barometers and the accurate measurement of atmospheric pressure. The test and examination of all mercury and aneroid barometers and their initial certification after manufacture shall in future be the sole responsibility of ISI.

0.4 In the formulation of this standard, due consideration has been given to the requirements laid down by the World Meteorological Organization, Geneva, as well as the special circumstances obtaining in the country.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements of aneroid barometers suitable for use both on land and on board ships.

*Specification for mercury barometer.

†Rules for rounding off numerical values (revised).

2. DESCRIPTION

2.1 An aneroid barometer consists of a closed metal chamber or capsule completely or partly evacuated and a strong spring system which prevents the chamber from collapsing due to the external atmospheric pressure. The aneroid chamber expands and contracts with the variations of the external pressure and these variations are magnified by a system of levers and indicated by a pointer on a graduated dial. The aneroid barometer is usually compensated for the effect changes in ambient temperature. A screw in the base plate enables the position of the carriage to be adjusted slightly and the zero to be altered. The complete mechanism is housed in a cylindrical brass case with a bevelled glass front. A movable index fitted to the glass face may be set independently of the pointer and is useful in showing changes in pressure (see Fig. 1).

3. TYPES

3.1 The aneroid barometers shall be of two types:

- a) Short range, graduated from 850 to 1 050 millibar in units of whole millibars; and
- b) Long range, graduated from 400 to 1 050 millibar in units of 2 millibar.

4. MATERIAL

4.1 The aneroid element shall be made from steel, beryllium copper or other suitable alloys.

4.2 The spring shall be made of spring steel and the arbor chain from steel.

4.3 The spindles and pivots in the linkage system shall be of silver steel.

4.4 The axle which holds the needle shall revolve in jewel bearings.

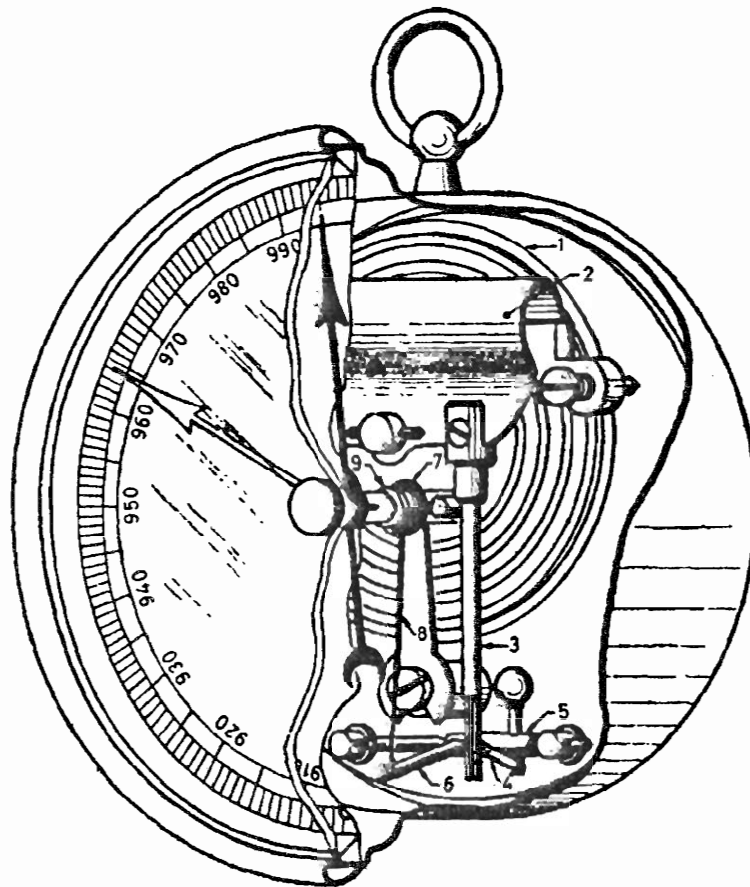
4.5 All other parts, unless otherwise specified, shall be of good quality brass.

5. DIMENSIONS

5.1 The dimensions of the various components of the aneroid barometer are left to the manufacturer and no rigid dimensional restrictions are indicated provided the product satisfies all the other requirements prescribed in the specification.

6. GENERAL REQUIREMENTS

6.1 The graduated dial of the aneroid barometer shall have a diameter of not less than 125 mm. Larger diameters giving greater accuracy of reading shall be preferred.



- | | |
|-------------------|------------------|
| 1 Vacuum Chamber | 6 Projecting Arm |
| 2 Spring | 7 Hairspring |
| 3 Arm | 8 Arbor Chain |
| 4 Connecting Link | 9 Pulley |
| 5 Rocking Bar | |

FIG. 1 ANEROID BAROMETER

6.2 The aneroid shall have the graduations on the disc either in one circle or two. In the latter case, the design shall be such that the pointer is capable of making two complete revolutions over the dial when it is subjected to the extremes of pressure within its range.

IS : 5793 - 1970

6.3 The aneroid shall be compensated for the effects of temperature such that the temperature errors do not exceed the limits of tolerance prescribed in the standard over the full range of the instrument.

6.4 A zero adjusting screw shall be provided for operation through an orifice in the back of the case. The screw shall have the capacity to alter the position of the pointer by at least 50 mb.

6.5 The case shall have an eye bolt fitted to it for suspending the instrument.

6.6 The material of the aneroid capsule and the spring shall be subjected to suitable treatment such that the secular change of the instrument defined as the gradual change in the error which goes on constantly irrespective of the current changes due to its immediate pressure and temperature history, is minimum.

6.7 A moveable index shall be fixed to the glass plate on top. It shall carry a short knurled head to enable it to be set by hand at any desired position on the dial. The free movement of the pointer, however, shall not be obstructed by the index.

7. WORKMANSHIP AND FINISH

7.1 The outer brass case shall be well-polished and gold lacquered.

7.2 The dial shall be matt white and the graduations shall be fine black lines of uniform thickness and depth throughout.

7.3 The pivots and bearings shall be well-polished and smoothened to minimize friction. The pivots and spindles shall be in correct alignment and lubricated very lightly.

7.4 The surface of the aneroid capsule shall be nickel plated and finished bright.

7.5 The complete mechanism shall be sturdy and be capable of withstanding ordinary transit risks without introducing inaccuracies outside the limits specified in the standard.

7.6 The pointer needle shall be well-balanced.

8. ACCURACY

8.1 The aneroid barometer shall be so compensated for temperature that the reading does not change more than 0.5 mb for a change of temperature of 30°C.

8.2 When tested in a suitably designed and operated vacuum chamber against a standard barometer whose errors are known and allowed for, the

IS : 5793 - 1970

scale errors at any point shall not exceed 1 mb for those having range up to 850 mb and 2 mb for those having longer range. The scale errors shall remain within these limits over periods of at least a year when in normal use.

8.3 The hysteresis shall be sufficiently small to ensure that the differences in reading before a change of pressure of 50 mb and after return to the original value does not exceed 1 mb.

8.4 The positional error of the instrument, that is, the difference in reading in the vertical and horizontal positions shall not be greater than 1 mb.

9. MARKING

9.1 All aneroid barometers shall have engraved on their dials the name of the units in which the barometer indicates the pressure, for example 'millibars'. The name of the instrument 'Aneroid Barometer' and the serial number and year of manufacture, for example, No. 123/1969, shall also be engraved on the dial.

9.1.1 The aneroid barometers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

10. PACKING

10.1 Each aneroid barometer shall be provided with a leather carrying case with strap or a suitable wooden box. In either case the inside shall have a suitable soft lining to protect the glass cover from damage and provide some degree of cushioning against shocks to the mechanism.

11. TESTING AND INSPECTION

11.1 Each barometer shall be tested individually for conformity to all the requirements of this specification.

PUBLICATIONS OF INDIAN STANDARDS INSTITUTION

INDIAN STANDARDS

Over 6 000 Indian Standards, broadly classified under the following main heads, have been issued so far:

Agriculture & Food	Electrotechnical
Chemical	Mechanical Engineering
Civil Engineering	Structural & Metals
Consumer Products	Textile

Of these, the standards belonging to the Mechanical Engineering Group fall under the following categories:

Basic Engineering Standards	Marine Engineering and Ship-building
Abrasives	Material Handling, Lifting Gear
Bearings	Mining
Bicycle Components	Pumps
Chemical Engineering	Refrigeration and Air-Conditioning
Engineering Metrology	Sewing Machines
Gas Cylinders and Fittings	Steam Tables
Gaskets and Packings	Threaded Fasteners and Rivets
Gears	Transmission Devices, Pulleys and Belts
Hand Tools	Weights and Measures
IC Engines and Automotive Vehicles	Wire Ropes and Wire Products
Instruments (Drawing, Optical and Surveying)	Unclassified
Machine Tools and Small Tools	

OTHER PUBLICATIONS

ISI Bulletin (Published Every Month)	Rs
Single Copy 	3.00
Annual Subscription 	25.00
Annual Reports (from 19-18-19 Onwards) 	2.00 to 5.00 each
Handbook of ISI Publications. 1970 (Pages viii + 629, Price Rs 12.00)	
incorporating annotations on all Indian Standards, and also listing ISO Recommendations and Publications of IEC	

Available from

INDIAN STANDARDS INSTITUTION

Headquarters

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 1

Telephone 27 01 31 (20 lines)

Telegrams Manaksanstha

Branch Offices

Telegrams Manaksanstha

Syndicate Bank Building, Gandhinagar
534 Sardar Vallabhbhai Patel Road
5 Chowringhee Approach
5-9-201/2 Chirag Ali Lane
117/418 B Sarvodaya Nagar
54 General Patters Road

Bangalore 9	Telephone	2 76 49
Bombay 7	„	35 69 44
Calcutta 13	„	23-08 02
Hyderabad 1	„	5 34 35
Kanpur 5	„	82 72
Madras 2	„	8 72 78

Printed at Neelkamal Printers, Delhi-6, India